Model: MTED01

Name: Central Computing Platform

Disclaimer

The information contained in this document is the proprietary information of BYD Auto Industry Company Limited.

The contents are confidential and any disclosure to persons other than the officers, employees, agents or subcontractors of the owner or licensee of this document, without the prior written consent of BYD, is strictly prohibited.

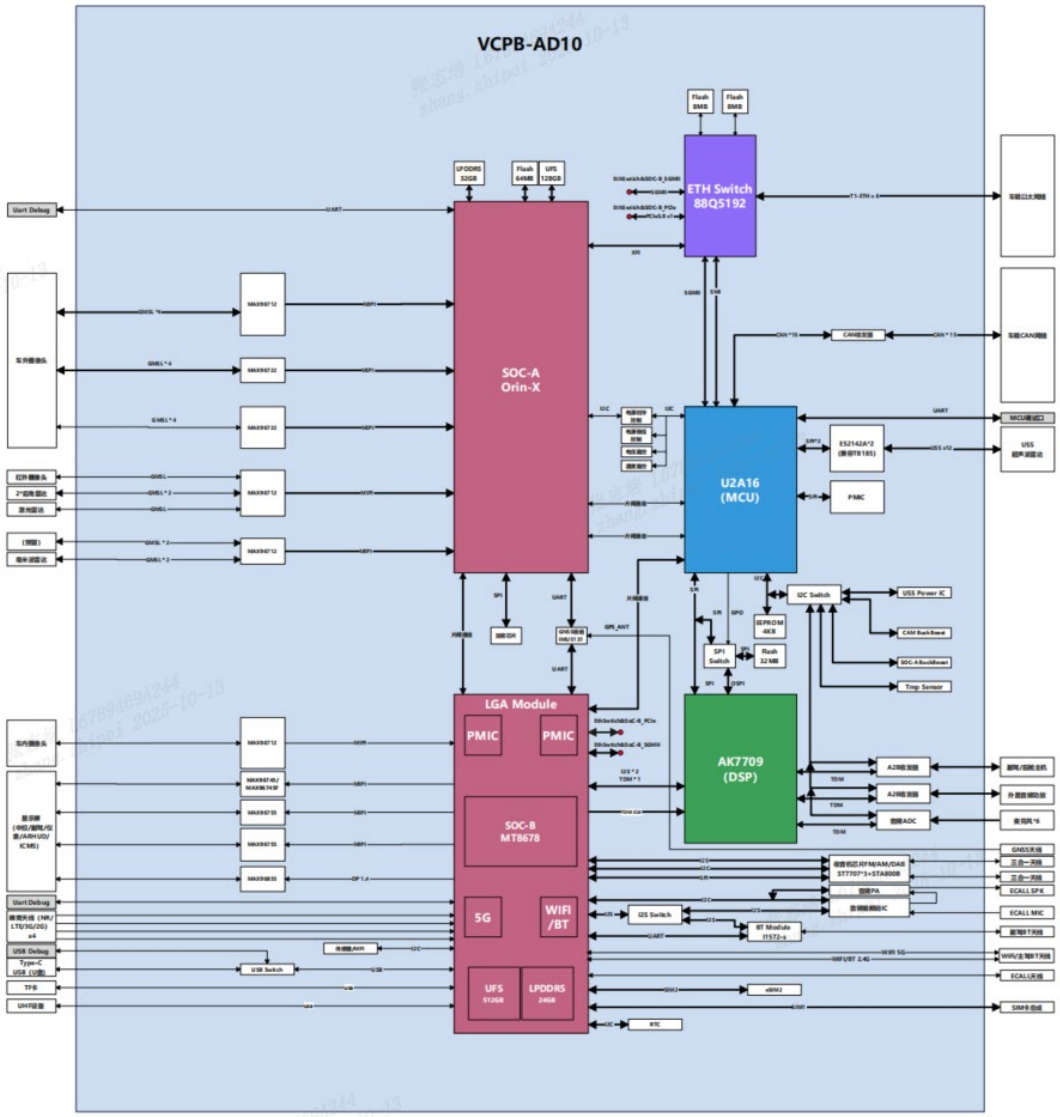
BYD makes every effort to ensure the quality of the information it makes available. Notwithstanding the foregoing, BYD does not make any warranty as to the information contained herein, and does not accept any liability for any injury, loss or damage of any kind incurred by use of or reliance upon the information.

BYD disclaims any and all responsibility for the application of the devices characterized in this document, and notes that the application of the device must comply with the SAFETY standards of the applicable country, and where applicable, with the relevant wiring rules.

BYD reserves the right to make modifications, additions and deletions to this document due to typographical errors, inaccurate information, or improvements to programs and/or equipment at any time and without notice. Such changes will, nevertheless be incorporated into new editions of this document.

The vehicle-mounted computing platform VCPB-AD10 is a new-generation vehicle domain control host developed by BYD, integrating intelligent driving and cabin functions. It is planned to be sold in various target markets. Regarding communication and wireless access, the platform supports the following functions: Bluetooth, WiFi, GNSS, FM, AM, 2G/3G/LTE/NR, etc.
This platform will be manufactured by BYD's Huizhou factory.

Hardware system block diagram



System Architecture

- The main functions of the host system:
- USB
- Cellular：
  UMTS (B/2/4/5/)
  Quad-band GSM/GPRS solution
  GSM(850/1900)
  LTEband:(B/2/4/5/7/12/13/14/17/25/26/38/40/41/66/71)
  5GNR:n2/n5/n7/n38/n41/n66/n71/n77/n78/)

- Connectivity:
  BT: 2400MHz-2480MHz;BT5.0
  WLAN:Frequency: 2.4GHz: 2.412-2.484 GHz; 5GHz:5.18GHz-5.845GHz;
  IEEE802.11a/b/g/n/ac/ax/be

- GNSS：
  GPS: 1575.42MHZ±1.023MHZ
  Galileo 1575.42MHZ±1.023MHZ

- Radio: AM/FM/DAB
  FM 64MHz-108MHz
  AM 520KHz-1710KHz
  DAB 174MHz-240MHz

- LCDdisplay

- Camera system

- Microphone and audio equipment

Main components

SOC：

- MTK8678
- ARM v9.0，1xARM XP-core，1xARM P-core，1xARM E-core
- LPDDR5X@8533MT/s
- USB2.0，DisplayPort 1.4
- UFS3.1 Gear4 2xlanes
- 3xDP 1.4，2xDSI DPHY1.2&CPHY1.2，4xeDP1.4b
- NR sub6, LTE Cat19, UMTS DC-HSPA+ R8+, GSM/GPRS/EDGE, CDMA2000

ADAS SOC：

- Orin-X
- ARM v8.2，12xARM Cortex-A78AE cores
- Ampere Architecture GPU,CUDA cores，Ray-tracing（RT）cores and Tensor cores
- FSI，4xARM Cortex-R52 lock-step cores
- 1x shared HDMI v2.1/DP v1.4a/eDP v1.4
- 6 MIPI CSI-2 v3.0 links
- 4xUSB2.0DSP
- AK7709: Highly integrated DSP, including 8 stereo channels and 4 SRC support up to 192kHz sampling rate, and integrating 6 DSPs for voice and audio processing.
- HiFi4a/HiFi4b：64-bit ，491.52MHz，MAC(Quad/Octal), ALU(4x64bits), IRAM0/IRAM1/DRAM1/Audio Buffer
- 77DSP1/2: 37-bit ，491.52MHz，Multiplier/Divider/ALU，PRAM(12k)/CRAM(16k)/DRAM(8k)/DLRAM(48k)
- 77DSP3/4: 37-bit ，491.52MHz，Multiplier/Divider/ALU，

PRAM(4k)/CRAM(20k)/DRAM(6k)/DLRAM(16k)

MCU

- U2A16
- CPU, 4 RH850 core/4 Lock-step core
- Total RAM 3584KB; Code Flash 16MB
- 16CANFD/10SPI/2I2C/24UART
- 1SGMII
- 94ADC
- ASILD

ETH

- MARVELL 88Q5192
- 4 x 100/1000BASE-T1PHYs
- 2 x 100/1000BASE-T1/TXPHYs
- 2 x RGMII/xMII
- 2 x 2.5G SerDes(SGMII/1000BASE-X/2500BASE-X)
- 2 x 10G SerDes with XFI
- 2 x PCIe（8Gbps Gen 3x1 Lane）

GSM/UMTS/LTE/NR

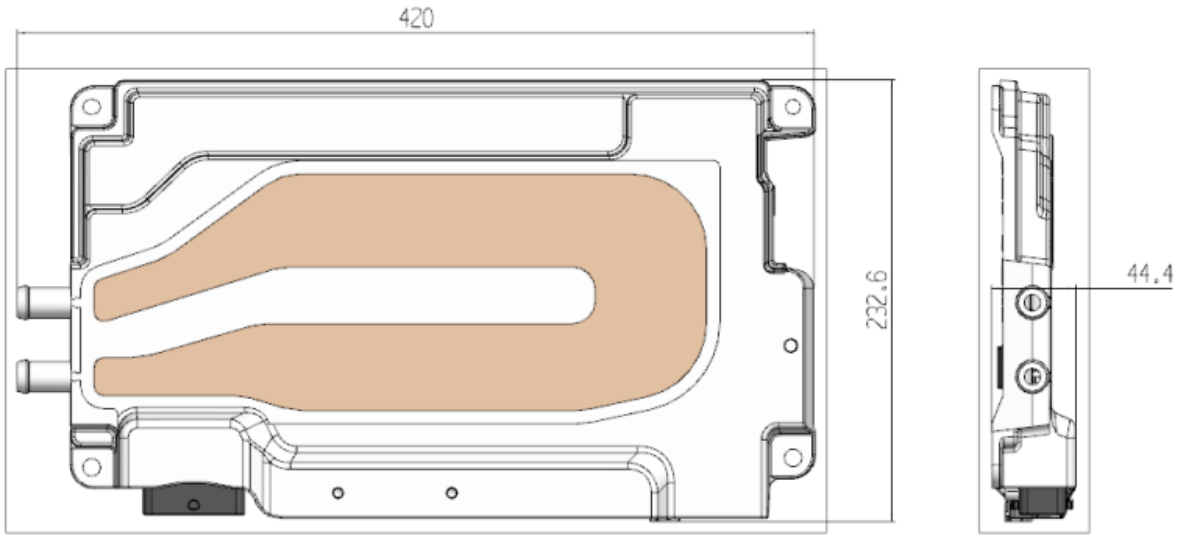
- This product adopts a hardware solution composed of MT8678, and combines it with the MT6199 radio frequency baseband chip to form a complete system suite.
- The tested equipment (EUT) supports the following frequency bands:
- UMTS (B/2/4/5/)
- Quad-band GSM/GPRS solution
- GSM(850/1900)
- LTEband:(B/2/4/5/7/12/13/14/17/25/26/38/40/41/66/71)
- 5GNR:/n2/n5/n7 /n38/n41/n66/n71/n77/n78/)
-
- Antenna:
- Antenna type: External antenna
- Impedance: 50 Ohm
- Modulation methods: GMSK, 8-PSK, QPSK, 16QAM
- Operating temperature range: -40°C ~ 85°C
- 1.2.2 WLAN and Bluetooth
- The central control unit uses a BT/WLAN dual-module (MT6653 chip from MediaTek) to achieve connection, and is equipped with an external antenna. It supports WLAN/BT 2.4 GHz and WLAN 5 GHz respectively.
- In the above figure, connector M13 is the WLAN/BT antenna port: WLAN 5 GHz, WLAN 2.4 GHz and Bluetooth share the same antenna. When conducting WLAN/BT radio frequency conduction tests, SMA radio frequency cables need to be used to connect these ports.
- MT6653 supports the IEEE 802.11 a/b/g/n/ac/ax/be WLAN standard and integrates Bluetooth functionality.
- Bluetooth 5.4, compliant with basic rate, EDR and BLE
- frequency: 2,402 - 2,480 GHz modulation: GFSK, p/4-DQPSK, 8DPSK

WLAN:

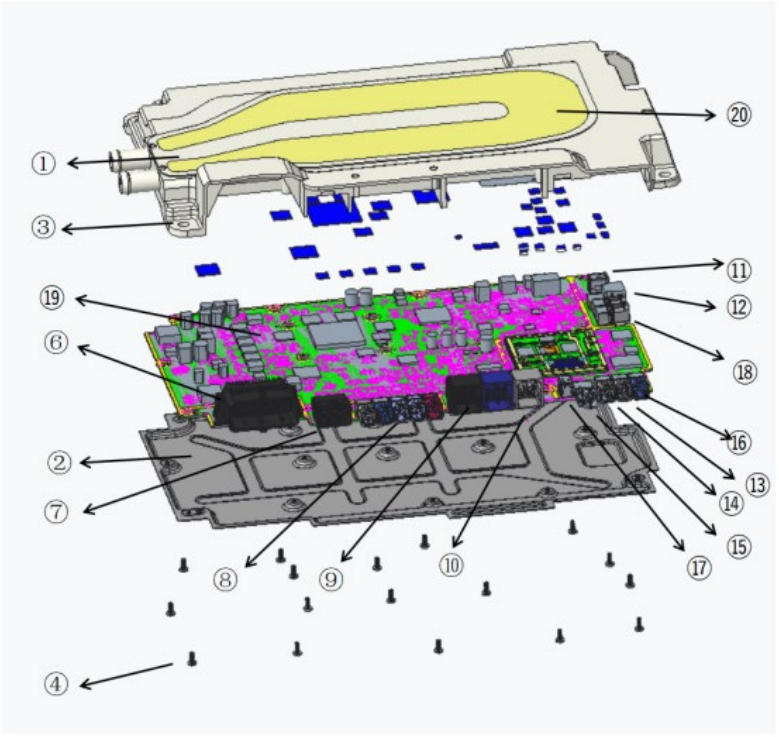
Standard: IEEE 802.11 a/b/g/n/ac/ax/be
Frequency: 2.4GHz: 2.412-2.462 GHz; 5GHz:5.18GHz-5.825GHz
Modulation:
CCK,DBPSK,DQPSK,BPSK,QPSK,16QAM,64QAM,256QAM,1024QAM,4096QAM
Power: < 20dBm

picture

Size



exploded view



FCC Statement

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC rules. Operation is subject to the following two

conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B

digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio ortelevision reception, which can be determined by turning the equipment off and on, the user is
encouraged to try to correct the interference by one or more of the following measures:
• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help important announcement
Radiation Exposure Statement
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with minimum distance 30cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
For FCC&IC, 5.2G is used for indoors only.